Cancel claims 1-17 and add new claims 18-34, reading as follows:

--18. (New) An arrangement comprising:

an interferometer arrangement;

an optical modulator for fast modulation being provided in an interferometer arm of said interferometer arrangement for heterodyne detection.

19. (New). The arrangement according to claim 18, wherein the interferometer arrangement has a measurement arm and the modulator is arranged in said measurement arm of said interferometer.

20. (New) The arrangement according claim 18, wherein the modulator is used simultaneously for switching and/or beam attenuation in a laser scanning microscope.

21. (New). The arrangement according to claim 18, wherein the interferometer arrangement has a reference arm and the modulator is arranged in said reference arm of the interferometer and is the measurement arm of the illumination beam path of a laser scanning microscope.

22. (New) The arrangement according to claim 18, wherein during a modulation by the modulator, a demodulation is carried out by a modulatable detector which is modulated by the modulation frequency.

23. (New). The arrangement according to claim 18, wherein the light source is a short-pulse laser.

24. (New). The arrangement according to claim 18, wherein the laser is also used for at least one of multiphoton excitation and SHG excitation.

25. (New). The arrangement according to claim 18, wherein the modulator is an acousto-optic modulator or electro-optic modulator.

26. (New) The arrangement according to claim 18, wherein a retroreflector is provided in the interferometer beam path for adapting the optical path length.

27. (New) A ,method for operation of an arrangement according to claim 21, comprising the steps of:

using the LSM for single-photon fluorescence imaging; and/or multiphoton fluorescence imaging; and

using the heterodyne detection for referencing the fluorescence to regions deep in the specimen.

28. (New) The method according to claim 27, wherein LSM images and heterodyne images are recorded simultaneously.

29. (New) The method according to claim 27, wherein the LSMimage and the heterodyne image are superimposed.

30. (New). The method according to claim 27, wherein reference points of the specimen are used to orient the specimen with respect to three-dimensional image stacks of the LSM.

31. (New). The method according to claim 27, wherein reference points of the specimen are used for orientation thereof in image recordings of temporal processes.

32. (New) An interferometric measurement arrangement for heterodyne detection, for use in an arrangement which comprises an interferometer arrangement and an optical modulator for fast modulation which is provided in an interferometer arm of the interferometer arrangement for heterodyne detection, said measurement arrangement comprising:

a dispersive unit provided in at least one interferometer arm, which dispersive unit splits the light into its spectral component parts and recombines these component parts;

imaging optics which image the spectral components in a focal plane within the dispersive unit; and

a light manipulator which changes the phase and/or amplitude of the spectral components being arranged in or in the vicinity of the focal plane.

33. (New) The interferometric measurement arrangement according to claim 32 including the step of using said arrangement for adapting dispersion.

34. (New). The interferometric measurement arrangement according to claim 32 including the step of using said arrangement for compensating dispersion when a short-pulse laser is coupled into an LSM.--

IN THE ABSTRACT

Cancel the present Abstract and substitute therefor the enclosed Abstract which is attached to the substitute specification.

IN THE DRAWINGS

As required, a substitute set of drawings is enclosed.